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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/559,152	04/26/2006	Holger Dziallas	034166.006US	9050

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ATLANTA, GA 30309-3592

EXAMINER

ENIN-OKUT, EDU E

ART UNIT	PAPER NUMBER
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1795

MAIL DATE	DELIVERY MODE
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08/04/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/559,152	Applicant(s) DZIALLAS ET AL.	
	Examiner Edu E. Enin-Okut	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 1-13, 21 and 24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-20, 22 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

MEMBRANE-ELECTRODE UNIT FOR DIRECT METHANOL FUEL CELLS
AND METHOD FOR THE PRODUCTION THEREOF

Response to Amendments

1. The amendments filed on April 28, 2009 were received. Applicant has amended claim 14 and cancelled claims 21 and 24. Claims 14-20, 22 and 24 are pending.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Terminal Disclaimer

3. The terminal disclaimer filed on April 28, 2009 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent No. 7,141,270 B2 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Priority

4. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

This application is claiming the benefit of prior-filed non-provisional Application No. 10/308,491 under 35 U.S.C. 120, 121, or 365(c) in an amendment to its specification filed on April 28, 2009. Since the reference to Application No. 10/308,491 was not filed submitted within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371 (b) or (f) in the later-filed international application or sixteen months from the filing date of the prior-filed application (see 37 CFR 1.78(a)(2)(ii)), the benefit claim to the prior-filed non-provisional application is improper. (It is noted

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that Application No. 10/308,491 was filed on December 3, 2002 and this application entered the national stage on April 26, 2006.) Applicant is required to delete the reference to the prior-filed application from the first sentence(s) of the specification, or the application data sheet, depending on where the reference was originally submitted, unless applicant can establish that the reference was unintentionally delayed (see 37 CFR 1.78(a)(3)).

Claim Rejections - 35 USC § 102

5. The rejection of claims 14, 18-20, 22 and 23 under 35 U.S.C. 102(e) as being anticipated by Wittpahl et al. (US 7,141,270 B2) is maintained.

Regarding claim 14, Wittpahl teaches that the anode gas diffusion substrate was coated with catalyst ink and dried at 90° C (7: 52-55). The cathode side of the membrane was coated with catalyst ink and dried at 70° C (7: 59-61). Membrane is coated with anode catalyst and dried at 70° C (7:66 and 8:1-2). Finally, the membrane is combined with the gas distribution layers (8:8-10; Fig. 1).

Regarding claim 18, Wittpahl teaches the cathode catalyst layer load is 0.2 mg Pt/cm² (7:49-51)

Regarding claim 19, Wittpahl teaches the anode catalyst comprises of supported or unsupported precious metal blacks (platinum black) (5:66-67 and 6:1-3).

Regarding claim 20, Wittpahl teaches that cathode catalyst comprises of platinum (6:4-5).

Regarding claim 22, Wittpahl teaches that the membrane is rinsed in hot water having a temperature of 80° C (7:61-63 and 8:2-4).

Regarding claim 23, the method taught by Wittpahl is for producing a membrane electrode unit for a direct methanol fuel cell (1:7-10).

Claim Rejections - 35 USC § 103

6. Claims 14, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. (US 2002/0071980 A1).

Regarding claim 14, Tabata teaches a method where the both sides of the electrolyte membrane are coated by catalyst (para. 59). The catalyst is also coated on the gas diffusion layer and subsequently air dried (para. 60). The membrane electrode assembly is then formed as shown in Fig. 4 (para. 61). Tabata also describes the formation of catalyst layers directly on the surface of an electrolyte membrane by spraying or screen printing (para. 9, 24, 43). For example, a catalyst ink may be coated on one side of the membrane with the subsequent removal of the ink's solvent or dispersant (para. 45-48).

Although Tabata does not expressly teach that the catalyst layer is “dried”, it would have been obvious to one of ordinary skill in the art at the time of the invention to remove the catalyst ink solvent or dispersant used in the method of Tabata by drying because it is well-known in the art as a means with which to remove solvents from solids.

Regarding claim 17 and 18, Tabata teaches that the catalyst content should be 0.1-0.5 mg/cm² (para. 42).

7. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. (US 2002/0071980 A1) as applied to claims 14 and 17-18 above, and further in view of Yamashita et al. (US 5,441,822).

Regarding claims 15 and 16, Tabata teaches the method for making a membrane electrode assembly as discussed above; however, the reference does not explicitly disclose the thickness of the catalyst layers.

Yamashita teaches the thickness of the catalyst layer is within the range of 0.05 to 0.5 mm (50 to 500 μm) (5: 30-35). Figure 5 shows the relationship between catalyst thickness and cell voltage (5: 36-

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46). The fuel cell performance increases and then decreases after a certain thickness (figure 5 and 5: 36-39).

Therefore, it would have been within the skill of one of ordinary skill in the art to adjust the catalyst thickness to yield an optimum fuel cell voltage. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. (US 2002/0071980 A1) as applied to claims 14 and 17-18 above, and further in view of Kindler (US 5,992,008).

Regarding claim 17, Tabata teaches the method for making a membrane electrode assembly as discussed above; however, Tabata does not expressly teach the anode catalyst loading. Kindler teaches a fuel cell with an anode catalyst loading of 1 mg/cm² (2:32-39). Kindler also teaches that the minimum amount of catalyst is desirable in order to reduce its cost (1:44-47). Therefore, it would have been obvious to one of ordinary skill in the art to use an anode catalyst loading 1 mg/cm² in the fuel cell of Tabata because Kindler teaches catalyst loading should be minimized to reduce cost.

Double Patenting

9. The rejection of claims 14, 21, 23-24 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 5, and 8 of U.S. Patent No. 7,141,270 B2 is withdrawn because applicant has submitted a terminal disclaimer that has been approved as noted above.

Response to Arguments

10. Applicant's arguments filed April 28, 2009 have been fully considered but they are not persuasive.

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11. In sum, Applicant arguments that: "... [the] Wittpahl '270 does not teach or suggest a process for manufacturing a MEU structure comprising a double layer anode or the unexpected advantages of such a MEU structure having a double layer anode. In addition, since the present application is a CIP of Wittpahl '270, applicants respectfully request withdrawal of the rejection. ..." (see p. 6 of its remarks).

First, Wittpahl does teach the manufacture of a double layer electrode as shown in Fig. 1 and discussed in the rejection above. Second, with respect to unexpected results, this argument is not applicable to a rejection under 35 U.S.C. 102(e). Third, regarding this application being a CIP and the asserted implications thereof, applicant is directed to the discussion of priority above.

12. As to the remainder of applicant's arguments, they have been considered but applicant has amended the claims such that new grounds of rejection were necessitated.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Edu E. Enin-Okut** whose telephone number is **571-270-3075**. The examiner can normally be reached on Monday – Thursday, 7 a.m. to 3 p.m. (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Edu E. Enin-Okut/
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795